ENTOMOLOGICAL NEWS

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ENTOMOLOGICAL NEWS

Vol. XLI No. 1

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1836-1901

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Stated Meetings of The American Entomological Society will be held at 7.30 o'clock P. M., on the fourth Thursday of each month, excepting June, July, August, November and December, and on the third Thursday of November and December.

Communications on observations made in the course of your studies are solicited; also exhibits of any specimens you consider of interest.

The printer of the "News" will furnish reprints of articles over and above the twenty-five given free at the following rates: One or two pages, twenty-five copies, 35 cents; three or four pages, twenty-five copies, 70 cents; five to eight pages, twenty-five copies, $1.40; nine to twelve pages, twenty-five copies, $2.00; each half-tone plate, twenty-five copies, 30 cents; each plate of line cuts, twenty-five copies, 25 cents; greater numbers of copies will be at the corresponding multiples of these rates.

BROOKLYN MUSEUM, BROOKLYN, N.Y.

GEO. P. ENGELHARDT

ENTOMOLOGICAL NEWS

VOL. XLI. JANUARY, 1930 No. 1

North American Institutions featuring Lepidoptera.

X. The Brooklyn Museum, Brooklyn, New York.

By J. D. GUNDER, Pasadena, California.

(Plate I.)

Not long ago I asked Mr. George P. Englehardt of Brooklyn, N. Y., our American authority on the family Aegeriidae (clear-wing moths), to give me some recent news about himself and also about the Museum with which he has been connected for so many years. This letter in reply will be of interest to Mr. Englehardt's many good friends.

Nov. 19, 1929.

DEAR FRIEND GUNDER:

Am sorry for the unavoidable delay in answering your letter of late date. It just happens to be a very busy time for me at the Museum.

Pending the completion of several tasks now in hand, I expect to retire from active service sometime this winter. This will terminate a continuous service of twenty-seven years with the Brooklyn Museum, but by no means will it conclude my personal interest in all matters pertaining to zoology and biology. On the contrary, I have been looking forward to the time when, relieved from the executive responsibilities as Curator of the Department of Natural Science, I may indulge more freely in serious research and particularly in such biological problems as call for study and investigation in the field.

Heretofore my duties at the Museum have left untouched hardly any subject connected with the natural and applied sciences. Consequently I have acquired a little knowledge about many things, but I do not claim to know a great deal about any one thing. Be that as it may, in retrospect I can visualize activities which will always remain a satisfaction and a joy. There

have been opportunities for travel and exploration on this continent, in the West Indies and in Central America, but above all I appreciate contacts with so many people, professional and novice, old and young, and the subsequent wide circle of enduring friendships in this country and abroad.

The Brooklyn Museum, a public institution under charter of the City of New York, established in 1898 for the promotion of cultural interests, including fine arts, decorative arts, ethnology and natural sciences, for sometime has felt the difficulty, shared by all museums, of providing adequately for the development of so many departments. A recent action terminating research work in the natural sciences, left this department in the possession of notable study collections bereft of their significance and, without provision for their safety and upkeep, subject to deterioration or possible destruction. The approval of a recommendation for the transfer of research collections perishable in nature to institutions best equipped for their care and development has been a source of much satisfaction to me.

The transfer of all our study collections of insects to the U. S. National Museum of Washington, D. C., supervised by Dr. Wm. Schaus and Mr. H. S. Barber, was completed during the summer. Included are the well known pioneer collections of lepidoptera of O. Neumoegen, E. L. Graef, George Hulst and others obtained by purchase or gift, as well as the very extensive collections in all orders secured on Museum expeditions by Jacob Doll[1], Chas. Schaeffer and the writer. About 1400 types are represented. Not included in this transfer are selections from all orders fully providing for purposes of exhibition and all materials pertaining to a so-called local collection with particular emphasis on the fauna of Long Island, but in general representative of New York state.

Temporarily excluded also has been the family Aegeriidae, with numerous types, to facilitate my revision now in course of preparation. Combined with my own and only personal collection, comprising some 3,000 specimens, there will be lacking only

[1] Mr. Doll passed away on Feb. 10, 1929, at the ripe old age of eighty-two years. See Englehardt's "Chapters from the long life of a Butterfly Collector" in the *Brooklyn Museum Quarterly*, October, 1925.

two or three of the 110 species so far listed for North America, while twenty or thirty more will be added as new.

The transfer of such important collections to another institution naturally has caused much discussion, favorable and otherwise. In the rapid growth of museums in this country there has been too much duplication of research collections and consequently a scattering of types, often inadequately and inaccessibly housed. It is the consensus of opinion that this condition should be adjusted through centralization, particularly of the types. The appeal is made to institutions and individuals alike.

The Brooklyn Entomological Society[2] is the second oldest association of its kind in the country and has enjoyed the hospitality and the cooperation of the Brooklyn Museum, as headquarters and regular meeting place, since 1912. With an average attendance of twenty out of fifty active members, the meetings are still full of zest and interest and the affairs of the Society are progressing favorably. The official organs of the Society, the *Bulletin* and *Entomologica Americana*, are now entering their twenty-fifth and tenth volumes, respectively. The following gentlemen have been serving as officers since 1920: *President*, William T. Davis; *Secretary*, Ernest L. Bell; *Treasurer*, Geo. P. Englehardt; *Editor*, since 1919, J. R. de la Torre-Bueno.

I hope this hurried résumé will be of assistance to you and I wish I had more time to go into detail.

Sincerely yours,

GEO. P. ENGLEHARDT, Curator, Department of Natural Sciences.

Agrilus fisheriana new name (Coleop.: Buprestidae).

Mr. W. S. Fisher has called my attention to the fact that Dr. Obenberger had used the name *Agrilus fisheri* in Philip. Jour. Sci., vol. 25. no. 5, 1924, p. 591. I therefore propose the name *fisheriana* instead of *fisheri* for the species described by me in Ent. News, vol. 40, p. 271, 1929.—J. N. KNULL, Bureau of Plant Industry, Harrisburg, Pennsylvania.

[2] For an interesting and comprehensive history of the Society, see Ann. Ent. Soc. Am., pp. 392-400, no. 2, vol. XXII, Sept., 1929. This is an article by Mr. Englehardt entitled, "The Brooklyn and New York Entomological Societies, past and present".

An European Plant-bug (Adelphocoris lineolatus Goeze) found in Iowa (Hemip.: Miridae).*

By HARRY H. KNIGHT, Ames, Iowa.

While conducting a field trip with a class in general entomology, June 18, 1929, at Ames, Iowa, the writer took in his collecting net the first specimen of *Adelphocoris lineolatus* Goeze known from the United States. This species was previously known from North America, but only from Cape Breton Island when the writer recorded it in 1922 (Can. Ent., liii, p. 287). It was indeed a great surprise to look into my collecting net and see this large plant bug running about for the first time, and to realize that I was actually collecting in Iowa. When this first specimen was safely bottled I proceeded to sweep the herbaceous vegetation along a fence row for a distance of about forty feet. An examination of my net revealed two more specimens of *Adelphocoris lineolatus* Goeze, also one or more specimens of *Miris dolabratus* Linn., *Stenotus binotatus* Fab., *Megaloceroea recticornis* Geoff., *Capsus ater* Linn. and *Trigonotylus ruficornis* Geoff. A few minutes later, *Capsus simulans* Stål was also taken, likewise two more specimens of *lineolatus*. This assortment of Palearctic species is rather remarkable I should say and can scarcely be duplicated from any other locality in North America. On June 22, I swept over the same ground without taking another specimen of *lineolatus* Goeze. I thought the species must be rare and that it might be another year before additional specimens could be taken. However, one of my students, Mr. R. L. Preston, took two specimens on June 30, along a road near the Agronomy farm just south of Ames. On July 2, we made a special trip to this point to search for the unusual Mirid. I soon began taking one or two specimens with each series of sweeps with the net. Within half an hour I found that most of the adults and many nymphs were to be found on alfalfa and sweet clover. Further collecting has shown that *lineolatus* is breeding in large numbers on both these plants, and nymphs are

*Contribution from the Department of Zoology and Entomology, Iowa State College.

rare if not absent on other plants. During July the bug has been found in such large numbers on alfalfa and sweet clover that it suggests the possibility of becoming a pest on these important plants. I will take this occasion to propose the common name "Alfalfa plant-bug" for *Adelphocoris lineolatus* Goeze.

In Europe *A. lineolatus* Goeze has been reported as found on *Chenopodium, Trifolium, Leguminosae, Umbelliferae, Eryngium, Carduus, Salvia, Euphorbia,* and *Calluna.* Fallen (1807) described our bug as new under the name *Lygaeus chenopodii,* indicating what he took to be the host plant. As yet we have not found it breeding on *Chenopodium* in Iowa.

The question of when and where *Adelphocoris lineolatus* Goeze was introduced into Iowa is a point which will become of more interest as time passes and the bug is found in adjoining states. Mr. R. L. Preston is making a survey of its distribution while working on the life history of the species and will report his results at some future time. Just now it seems rather likely that the point of introduction was at Ames or Des Moines, with Ames more nearly the center of distribution as found by Mr. Preston. How long it has taken this insect to attain its present abundance and distribution is a question of interest to us. No specimens were taken in 1928, yet the writer and several students did fully as much collecting in this area last summer. During July, many specimens of *lineolatus* have been taken about electric lights on the campus; also we have found it very abundant in fields of alfalfa and sweet clover. The species has certainly increased greatly in numbers since last summer, or we most certainly would have found it then. A guess is not worth much but I would suggest that the species must have gotten its start from three to five years ago. Mr. Preston has taken specimens over an area of about 75 miles from south to north with Ames about the center of distribution.

Should this insect develop into a pest on alfalfa, as it gives some promise, it will become of wide interest and concern. In any case it represents the introduction and spread of an exotic

species, and as a biological problem, will interest many students of entomology. No doubt the species was imported into Iowa in the egg stage, which could easily happen if parts of the host plant were used as packing in some shipment of material from Europe. Just what materials have been shipped into our area is a matter we hope to investigate as opportunity permits.

It is hoped this notice may stimulate collectors in the states bordering Iowa and that some may sweep alfalfa and sweet clover during the next two or three years and report the occurrence and spread of *Adelphocoris lineolatus* Goeze.

As an aid for recognition of the species the following general description is given:

♂. Length 8 mm., width 2.8 mm. General coloration pale yellowish with a tinge of brown and dusky; scutellum with two fine, longitudinal fuscous marks on middle, corium usually with a triangular fuscous area on apical half, cuneus pale, membrane fuscous. Antennae yellowish to brown, apical half darker and usually reddish brown. Legs yellowish, femora with many black dots, anterior aspect with two rows of somewhat larger spots; tibial spines black, without distinct spots at base. Clothed with simple, pale yellowish pubescence, but black on the legs.

Head: width 1.36 mm., vertex .42 mm. Antennae: segment I, length .98 mm.; II, 2.87 mm.; III, 2.2 mm.; IV, 1.3 mm. Pronotum: length 1.3 mm., width at base 2.25 mm.

♀. Length 7.5 mm., width 2.9 mm. More robust than the male and usually somewhat paler in color, but otherwise very similar in form and coloration.

Nymph, fifth instar. Length 5.5 mm., width 2.4 mm. Head: width 1.17 mm., vertex .52 mm. Antennae: segment I, length .73 mm.; II, 2.3 mm.; III, 2 mm., IV, .85 mm. Color uniformly yellowish green, third and fourth antennal segments reddish brown, tips of wing pads becoming fuscous. Legs uniformly pale yellowish and marked with black spots as in the adult. Dorsum and legs set with short stiff black hairs; antennae clothed with black pubescence.

Size slightly larger than *Adelphocoris rapidus* Say, but easily distinguished by the paler color. The general habits and actions of *lineolatus* Goeze are very similar to our native species, but it runs about in the net even more swiftly than *rapidus* Say.

Observations on Megathymus streckeri (Lepid.: Hesperiidae).

By R. A. LEUSSLER, Omaha, Nebraska.

In the sand hills of Nebraska where the yucca flourishes, there is found a race of *Megathymus streckeri* which appears to be intermediate between *streckeri* Skinner and *streckeri-texana* B. & McD.

This race, however, as shown in a series of specimens from this locality, is so extremely variable in all its characters that I do not deem it advisable to propose a name for it.

Compared with *streckeri-streckeri,* and speaking generally, both males and females average somewhat larger and lack the light-brown shading of the discal area of the under surface of the secondaries. The males have the spots on the upper side of primaries noticeably larger, and on the under side both larger and better defined. The white spots on the under side of secondaries are less pronounced, and the dark blotches found in *streckeri-streckeri* when the spots are reduced, are almost entirely obsolete. In the females a prominent band of from 4 to 6 spots on the upper surface of the secondaries constitutes the chief difference. On the under surface of the secondaries this sex has the spots more yellowish than in *streckeri-streckeri.*

Judging from the original description of race *texana* and the figure of the female type, the Nebraska race is pretty close to *texana,* but as a rule the following differences can be noted: It averages larger in both sexes, although some individuals are quite as small as the types of that race; the spots on under surface of secondaries are more pronounced and in the female are yellowish; the spots on upper surface are not as deep orange yellow as in *texana,* and in the female the band of spots on upper surface of secondaries is better developed, although occasional small specimens appear which have the spots no better developed than *texana.* As stated above, there is a great deal of variation in Nebraska specimens. This variation is in the size of the insects; in the shape and size of spots; in

the number and color of spots. Some of the males match up pretty well with *streckeri-streckeri,* some of the females with *streckeri-texana* and some with an unnamed female supposedly from northern Texas which B. & McD. have suggested may be intermediate between *streckeri-streckeri* and *streckeri-texana.* It is my opinion that the Nebraska race is exactly that, *i. e.,* intermediate between the two named races, and that it is very plastic.

The insect flies in the sand hills from about the 5th of June until the latter part of that month. The males have a habit of settling on last year's flower stalks of the yucca plant with the forewings folded together and the hindwings in a horizontal position. In this posture they greatly resemble old dry seed pods of the yucca and are hard to detect. They are wary and hard to approach. When alarmed their flight is swift and they usually fly over the top of a hill and are lost to view. Their principal flight is from 9 in the morning until 3 in the afternoon. The females appear about a week later than the males. They are less active, sitting for the most part at the base of yucca plants with wings tightly folded. After the females appear the males become very active. They circle about in swift flight, in overlapping circles or fly zigzag fashion, frequently dropping back and seeming to explore the same ground over and over again.

Oslar has stated that the female of *streckeri* is crepuscular and that oviposition occurs from sunset until well into the night. My own observation does not bear out this statement. At least not as regards the *streckeri* of the sand hills. The females were observed to be ovipositing in the afternoon in brightest sunshine. Their flight at this time is quite slow and they seem so occupied with their purpose that it is not difficult to approach them. Soon after 4 o'clock both sexes become inactive, seeking resting places in the sparse grass or on the bare sand where they are hard to see. When flushed up they fly some distance and again settle as before. This they repeat

as often as they are flushed up. On the evening of one day when the insects had been on the wing in numbers, I made it a point to visit their haunts from 6 o'clock until dark and could not find a single individual although other butterflies (*Nathalis iole, Euptoieta claudia* and *Pieris protodice*) were observed, as well as Noctuid moths and beetles.

When ovipositing, the females, if not disturbed, fly from plant to plant, frequently resting to deposit an egg. The egg is deposited on either upper or under side of the yucca leaf about midway between the base and tip. The egg is smooth, bluish green in color, somewhat whitish at the crown. It is flattened and measures 4 mm. in circumference and 2 mm. in height. An egg secured immediately after it was deposited on June 14, hatched out June 26. The larva was 5 mm. in length, pale salmon pink in color with large black head and black on first segment back of the head. It ate the tender part of a yucca leaf and formed a cylindrical case in which it concealed itself. On June 29, it apparently had passed through its first moult, as it was considerably longer, lighter in color and the head was smaller in proportion. When 6 days old the larva gave evidence of its burrowing habit by boring into the cork of the bottle in which it was kept. When extricated and given the thick part of a fresh yucca leaf it burrowed into the fleshy part of the leaf and ate its way along the inside of the leaf, making a channel barely larger in diameter than the thickness of the larva itself. When resting, the larva does not remain at the end of this channel but draws back some distance. On July 13, it was ¾ inch long, dirty-white in color with dark head and dark spot on first segment. On that date I placed the young larva on a yucca plant in the open, when it entered the leaf from the under side, made its way, over a period of several days, to the main stalk and is apparently making its way downward into the root. At the point where the stalk meets the ground line the larva left a hole in which it will presumably pupate next May.

An Experiment in Marking Moths and Finding them Again (Lepid.: Noctuidae).

By Auburn E. Brower, Willard, Missouri

(Map, Plate II.)

The spread of species, the migration of flocks, and the records of individuals outside the usual range of the species have all been the subject of many scientific papers. The migratory swarms of *Alabama argillacea,* the cutworm moths, and other pests have received much attention from economic entomologists, But I have been unable to find any empirical data regarding the movement of marked individuals of the moths. The chances of ever again finding a marked moth are so small that nothing positive seems to have been ascertained regarding the movements of the individuals. In some sections, however, the genus *Catocala* seems to offer a chance for positive data as to the movements of individuals. Large in size, showy in color, single-brooded, of many species and forms, and in some localities found by day resting low-down on tree trunks, they offer a combination of characteristics which lend themselves to such an investigation.

In 1927 plans were made to mark some Catocalas and attempt to find them again, but the first requisite to finding them on tree trunks—a stretch of hot, dry weather during the height of the *Catocala* season—was absent. Again in 1928, weather conditions were unsatisfactory. In 1929 the happy combination of numbers of Catocalas with a severe drouth in the height of the *Catocala* season resulted in the following work.

The locality (seven miles northeast of Willard, Missouri) is in the Ozark Mountains in southwest Missouri, at an elevation of about 1050-1340 feet. The timbered hills bordering the higher lands are the best *Catocala* country. The area selected, about 1x1½ miles, has been my favorite collecting ground for the last fourteen years. The area contains four separated hollows, each a good collecting ground, separated by ridges and unfavorable hollows. In each of these hollows, except Long Hollow, the area occupied by the moths during hot, dry weather is compact enough so that it can be covered in a half-day.

Lacquers were found to be most satisfactory for marking the moths, as a non-flowing, quick-drying material is needed. Thick oil colors were satisfactory. With enamels, the scales had to be partially removed. Ordinary paint was unsatisfactory. Fine, short-bristled enamel brushes proved best, and all coloring materials needed brushing in, especially on some fresh moths.

A different color was used in each hollow. Bright green, white, red and purple were used, with yellow for some of the last moths. In each locality, on the first half day, the right fore-wing was marked, the next time the left wing, then both wings were similarly marked, and lastly the wings were marked differently. By using two colors many combinations would be easy. Each individual of a species or form received a different mark or combination of marks. Each insect as taken was given a consecutive number in a note-book, a sketch was made of the marked wing or wings, and the location of the tree on which it was captured was recorded.

The cyanide jar (sodium cyanide) was used to stupefy the insects. A few were netted, but they were rubbed in the net and struggled so violently while being marked that considerable injury resulted, and none of them was ever found again. The original plan, to mark them as they rested on trees, was also abandoned, except for occasional specimens. The scales shed off coloring materials so readily that great difficulty was found in getting on any color, and the frightened moth had to be followed to see what, if any, mark had resulted, which could not always be done. With the cyanide jar, the moth could be turned out as perfect in appearance as before being caught, and any marking (which should not be too heavy) brushed into the scales. The sketch of the wing and marks could be accurately made, and, if the moth were turned out as soon as the struggles ceased, it would often be crawling up on a tree by the time the data had been recorded. Time and again individuals which had been marked were observed again before work was discontinued in that hollow. As soon as they recovered from the effects of the gas, they took the normal head-down position low-down on the tree trunks, and if they were flushed later, behaved normally in every way so far as I could see.

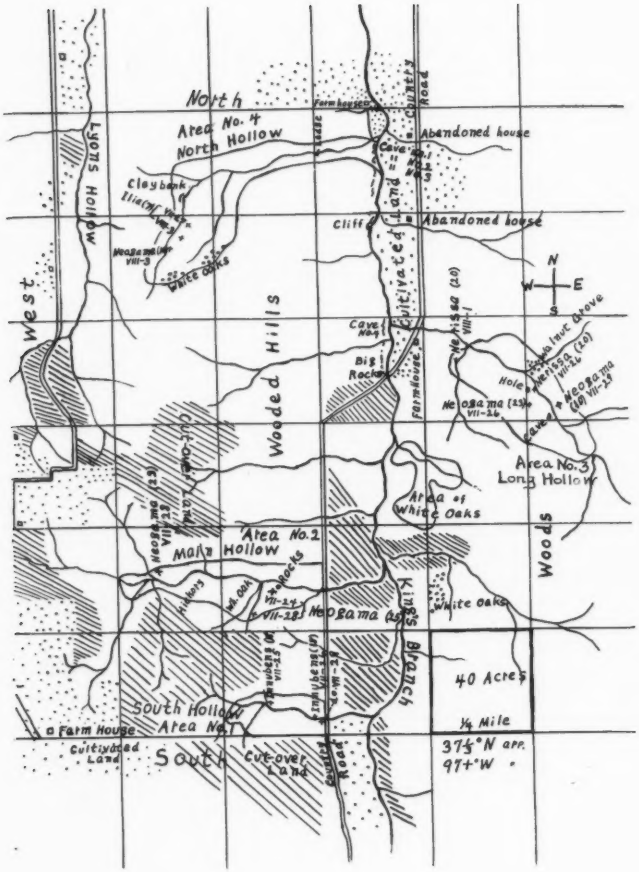
TABULATION OF MARKED MOTHS.

Giving Date, Locality, and Numbers of all Forms Marked.

	July.																				August.										Totals	
	24		25		26		27		28		29		30		31		1		2		3		4		5							
CATOCALA	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.			A.M.	P.M.			A.M.	P.M.		P.M.		P.M.					Forms	Species
	1*	2	1	2	1	3	4	3	4	2	1	3		4			3	3			4	3		1		3					
Ilia	1	11	4	4	2	7	7	6	6	5	1						1	4			1			1							61	
Conspicua				3	1	2	1	2	1			1					2	1			1					S					15	
Normani							1	1	1		1															e					4	80
Neogama	2	7	3	2	1	10	3	9	1	6	4	6						5			2	1				a					62	62
Amica			1	2	1	2	1		3					1				1								r					12	
Androphila	1	2				1	1	1	2					1				2								e					11	
Nerissa	1	2	1			10	9	3	5																	h					31	54
Epione	4	3	2	2	3		1	2			3	1		1				1			1					c					24	24
Innubens	3	3	2	2		2	2	1		1	2	2						1			1	2				d					24	
Scintillans			1																												1	25
Lacrymosa		1				3		2			2	3						2			4	7		1		i					25	
Evelina																						1				n					1	
Paulina						1																									1	27
Palaeogama		1				2	2	1										1				1				L					8	
Annida			1																							o					1	9
Luctuosa	1																									n					1	1
Piatrix			1		1	1	1	1		1								1								g					7	7
Obscura								1			1							1													3	3
Residua		1		1		3			1									1			1					H					8	8
Vidua			1			1												1								o					3	3
Habalis							2				3	1														l					6	6
Flebilis																					1	2				l					3	3
Angusi																						1				o					1	1
Junctura														1												w					1	1
16 Spe. 8 Vars.	13	31	17	16	9	45	31	30	19	14	17	14		4			3	22			12	15		2							314	314

*These numbers refer to the areas where marking work was carried on upon that date.

The decrease in numbers of marked insects toward the end of the work is partly due to unfavorable weather, but it is largely due to the fact that the time was devoted to searching for Catocalas marked instead of marking more.



MARKING MOTHS.—BROWER.

So many factors, such as lizards, squirrels, other insects, direct sunlight, wind-swayed vegetation and thunder storms cause the moths to change their position that they are not greatly frightened by their capture and marking. The number of times some individuals were found is proof that they do not desert the locality. Usually, marked individuals were recognized before being disturbed, and that was the end always sought.

The period when the work was carried on, July 24 to August 6, is the height of the *Catocala* season. The first six days were an unbroken stretch of hot, dry, and calm days. Light, hot winds blew from the west some days, and then the moths were most abundant, especially females. Beginning the night of July 29, local showers and cool winds at times resulted in disturbing meteorological conditions which continued to the end, the work terminating with a rain the night of August 5. No rain fell in the area except very light showers July 30 and August 3. August 4 was clear and bright, but with a cool east wind scarcely a *Catocala* could be found. The table shows the effects of the unsettled weather.

RETURNS FROM MARKED CATOCALAS

ILIA, marked July 25, in Main Hollow. Found July 30, 50 yards east.*

ILIA, marked July 27, in North Hollow. Found August 3, 70 yards southwest.

NEOGAMA, marked July 24, in Main Hollow. Found July 28, 125 yards southwest.

NEOGAMA, marked July 26 in Long Hollow. Found July 28, 1 mile south of west.

NEOGAMA, marked July 26, in Long Hollow. Found August 1, 25 yards north.

NEOGAMA, marked July 27, in North Hollow. Found August 3, 7 yards west.

NEOGAMA, marked July 29, in Long Hollow. Found August 3, 1 mile north of west.

NEOGAMA, marked July 29, in Long Hollow. Found August 1, 125 yards southeast.

*Part of the distances were paced, the others are estimates made on the ground.

NEOGAMA, marked August 1, in Long Hollow. Found August 3, 175 yards south.

AMICA, marked July 26, in Long Hollow. Found August 3, 45 yards east.

AMICA form NERISSA, marked July 26, in Long Hollow. Found August 1, 330 yards northwest.

AMICA form NERISSA, marked July 27, in North Hollow. Found July 28, 25 yards southwest.

AMICA, marked August 1, in Long Hollow. Found August 3, 100 yards east.

EPIONE, marked July 24, in Main Hollow. Found July 25, in the same place.

INNUBENS, marked July 24, in South Hollow. Found July 25, 15 yards east and July 26, 78 yards west.

INNUBENS, marked July 24, in Main Hollow. Found July 25, nearby.

INNUBENS, marked July 25, in South Hollow. Found July 26, 330 yards east, and July 29, 360 yards east.

INNUBENS, marked July 27, in Long Hollow. Found July 29, 10 yards west.

INNUBENS, marked July 29, in Long Hollow. Found August 1, 35 yards northeast.

INNUBENS, marked July 29, in Long Hollow. Found August 1, 235 yards northwest.

LACRYMOSA, marked July 26, in Long Hollow. Found August 1, 90 yards northeast.

LACRYMOSA, marked July 29, in Long Hollow. Found August 1, 25 yards west.

LACRYMOSA, marked August 1, in Long Hollow. Found August 3, 220 yards southeast.

PALAEOGAMA, marked July 26, in Long Hollow. Found July 29, 80 yards southwest.

PALAEOGAMA, marked July 26, in Long Hollow. Found August 3, 40 yards northwest.

PALAEOGAMA, marked August 1, in Long Hollow. Found August 3, 40 yards south.

RESIDUA, marked July 24, in Main Hollow. Found July 25, 100 yards northeast and July 30, where marked.

RESIDUA, marked July 26, in Long Hollow. Found July 27, 25 yards southeast, July 29, 85 yards southeast and August 3, where marked.

RESIDUA, marked July 26, in Long Hollow. Found August 1, 43 yards southeast.

VIDUA, marked July 25, in South Hollow. Found July 29, 60 yards southeast.

(To be continued)

EXPLANATION OF PLATE II.

This map shows the section where the moths were marked. Unless otherwise indicated, the region is all timbered. The farm lands are stippled, and the cut-over land is obliquely shaded. The numbers and names of the four areas or hollows (enclosed by solid lines), where actual marking work was carried on, are used as column headings in the tabulation of moths marked and in the list of returns. Thus the area in which every moth was marked is given. Some of the places labeled on the map are unmentioned in the text, these and many more served as a basis for note-book entries of the exact place where every moth was marked or was found again on some later date.

A New Species of Acmaeodera and One New Subspecies (Coleoptera, Buprestidae).

By J. N. KNULL, Pennsylvania Bureau of Plant Industry, Harrisburg.

Acmaeodera pinalorum new species.

Form and size of *Acmaeodera guttifera* Lec., color dark bronze, elytra bluish black, each elytron with eleven irregular yellow spots (paratype with twelve spots which is probably a variable character). Head densely strongly punctured, front with long white pubescence, antennae serrate, beginning with the fifth joint.

Pronotum wider than long, widest in front of middle; front narrower than base, convex, sides broadly rounded from base to apex, side margins not visible from above, surface densely coarsely punctured, punctures coarser and confluent at sides, a short stiff hair arising from each puncture. Elytra at base as wide as base of pronotum, slightly wider back of base, sides sinuate on apical third, broadly rounded toward apices, side

margins serrate on apical half, surface with striae more evident on apical third, punctures of striae coarse, intervals each with a single series of fine punctures, each puncture with a short stiff hair.

Beneath densely coarsely punctured, pubescence short, prosternum produced in front into a broadly emarginate lobe which is rounded at ends, edge of last ventral turned down forming an apical plate, no trace of subapical plate. Length 8 mm., width 2.5 mm.

Described from two specimens labeled base of Pinal Mountains, ARIZONA, July, altitude 4,000 feet, Duncan and Parker, collectors. *Type* in writer's collection, paratype in the collection of Mr. D. K. Duncan who kindly allowed me to retain the types.

This species would fall in group Acmaeodera Lobatae.*

Professor Fall kindly examined both insects herein described.

Acmaeodera gibbula gila new subspecies.

Size and form of *Acmaeodera gibbula* Lec., color of body, head and pronotum bronze, elytra dark blue, entire insect void of yellow markings. Head densely coarsely punctured, thickly clothed with long white pubescence, antennae serrate beginning with fifth joint.

Pronotum twice as wide as long, sides regularly arcuately narrowed from base to apex, impressions moderately deep, side margins not visible from above, surface closely punctate, clothed with long white pubescence. Elytra at base as wide as base of pronotum, slightly wider just back of base, sides sinuate, then nearly parallel to back of middle, strongly rounded to apices, side margins strongly serrate back of middle, surface with striae more evident on apical third, second, third and fifth intervals more convex toward base, punctures coarser toward sides, very small in center toward base; intervals each with a single series of fine punctures, a short stiff hair arising from each puncture.

Beneath densely punctured, legs and ventral surface with long white pubescence, prosternum produced in front into a subrectangular lobe which is truncate in front; last ventral with a thin broad apical plate which gives the appearance of a double margin. Length 9.5 mm., width 3.5 mm.

Described from a specimen in the collection of the writer labeled Gila River Valley, San Carlos, ARIZONA, August, D. K. Duncan collector.

*H. C. Fall—Jour. N. Y. Ent. Soc., V. 7, P. 35, 1899.

A New Butterfly (Lepid.: Nymphalidae).

By NORMAN R. GUNN, 1951 Yosemite Road, Berkeley, Calif.

Melitaea palla (Bdv), Ab. **hemifusa** nov.

Upper surfaces: *Primaries*—Typical as in male *palla* (Bdv). *Secondaries*—Submarginal and next two adjoining rows of spots are completely fused together. The basal area of secondaries is completely obscured by black, except for one elongated spot which does not vary from typical *palla*. Marginal row of spots same as in *pala* but separated from fused area by a narrow black band.

Under surfaces: *Primaries*—Yellow area reduced and fused at apex. Black markings reduced. *Secondaries*—Marginal row of spots normal but bordered on inner side by a distinct black line. Submarginal and adjoining two rows fused with yellow. The third marginal row of spots is not completely obscured and is reduced as it nears inner margin of secondaries. Basal area obscured by red except for one yellow spot. This fusion of yellow is similar to that of ab. *abnorma* (Wright) of *Melitaea hoffmani* (Behr).

Classification: Ab. Hemifusion. Secondaries well fused, primaries normal.

Data: *Holotype* male. Expanse 35 mm. Cazadero, Sonoma County, California. May 18, 1929 (G. E. Bohart, Collector). Holotype in the Bohart collection at Berkeley, California.

Life History: Probably same as in *palla*. Refer to Comstock's "Butterflies of California" for information.

The Fixation of Types.

By W. S. BLATCHLEY, Indianapolis, Indiana.

"The type specimen in biology is that *individual* of animal or plant, or any part of one, from which the description of a species has been prepared and upon which a specific name has been based. It is the *actual object* which serves as the type of a species in zoology or botany. Type specimens have a particular part and high value in descriptive zoology and botany, comparable to that of the actual object which is taken as the authoritative standard in any system of weights, measures, or coinage. When available for examination they take precedence over any published description or figure and are conclusive evidence in cases of doubtful or disputed specific identity."[1]

Accepting the above as a full and, in my opinion, an excellent definition of a *type,* the question arises as to who best knows what that type is. Is it the author of the species who has used a certain individual specimen as most typical of the form which he has described and who has placed aside that individual and labeled it with the name he has given it and the word "type"; or is it some other human who has never seen the author's true and only labeled type, but who, impressed perhaps by the importance of his own superior knowledge of the particular group to which the species in question belongs, "fixes" and designates a specimen in another collection as the type of the species in question?

In the past it has been my custom, when describing what I consider a new species, to select a certain typical individual specimen and to attach to it a red label "type." I have not always designated as part of the description this particular specimen as the "holotype" as I expected in time to prepare a single paper in which I would designate or fix the holotypes of all the species I have described.[2]

On pages 625 and 626 of the *Orthoptera of Northeastern America,* I described as new two species of camel crickets, *Ceuthophilus davisi* and *Ceuthophilus rehebi,* from specimens furnished me by W. T. Davis, of Staten Island, New York. I picked out the most typical example of each, labeled it with a red label "type" and placed on the pin also the name which I had given it. I retained these types in my collection and returned part of the other specimens to Mr. Davis. In the *Florida Entomologist,* XIII, 1929, pp. 18 and 19, Mr. T. H. Hubbell has made *rehebi* a synonym of *davisi* and has designated or "fixed" a certain specimen of each in the Davis collection as a "lectoholotype." Now I do not know, nor do I care, what the ruling of the Entomological Code is in such a case as this. I hold that it is an unjust and unreasonable procedure for the following reasons: (*a*), The author of the species is still living and has in his own collection the original holotype labeled as such; (*b*), The examples so labeled in the Davis collection may or may not be part of the cotypes which I examined and re-

[1] Century Dictionary, Vol VIII, p. 6562. The Italics are mine.
[2] This paper is now completed and ready for the press.

turned to Mr. Davis as such, as he had numerous other examples of the same species; (*c*), In similar procedures a person fixing a type, without seeing the one labeled as such by the original author, may even designate an example of a different species or a different genus from the one originally described under that name. Had I died without labeling a specimen in my collection as "type" then, and then alone, would Mr. Hubbell be justified in his action, and not even then until he had carefully compared the specimen so designated with those in my collection under that name.

The designating of a single specimen by the author as the "type" and the term "holotype" used therefor are both recent but very useful practices. According to Henshaw, Dr. J. L. Leconte named as new species 4734 forms of Coleoptera and, according to Calvert, Dr. G. H. Horn named 1582. In very few instances did either of these authors designate a holotype. Maj. T. L. Casey named probably eight or ten thousand species and it was not his practice to name holotypes in connection with his descriptions. H. C. Fall has named approximately 1200 and it is only in his later writings that he designates holotypes in the notes following his descriptions. If other authors were to follow Mr. Hubbell and designate lectoholotypes of numerous species described by these authors but outside of their original collections, there would be a veritable hodge-podge of nomenclatorial confusion. The action of Mr. Hubbell, whatever the Entomological Code may hold, is, in my opinion, much like the heirs meeting and attempting to divide a man's property who is on his death bed but yet alive; or like a Governor appointing a man to fill an office while his predecessor, though expected to die, is yet living and still holding the office.

In conclusion I will say that the holotype of *Ceuthophilus davisi* is a male, labeled "Staten Island, N. Y., Aug., 1917, Coll. by W. T. Davis" and that of *Ceuthophilus rehebi* is a male labeled "Yaphank, N. Y., Aug. 26, 1916, Coll. by W. T. Davis." Both are in the collection of W. S. Blatchley, and not in that of W. T. Davis, and they will be "fixed" as holotypes, not lectoholotypes, in the paper above mentioned which will soon be issued.

The Night Flight of Diurnal Butterflies (Lepid.).

Butterflies are day-flying creatures, while most moths fly by night. There are exceptions, however, and it is a well-known fact that a few certain species of moths normally fly by day, but the meagre records of night flights of butterflies indicate that this is an abnormal or unusual condition.

Scudder deals with this topic in a chapter, entitled "Butterflies at Night",* in which he says that butterflies fly by day and generally by the brightest day and in the clearest weather, yet some groups love the forest gloom; a few favor twilight, and the exceptions to the general rule are those which fly by night. He then lists the following instances of this unusual condition:

Eugonia j-album, the Compton tortoise, hundreds of which had flown to a light-house lantern on the Island of Nantucket.

Chlorippe celtis, which is reported by Miss Murtfeldt as entering an open window at 10 o'clock one August evening.

Anosia plexippus, recorded by Merriam in large swarms that flew against and obscured the light of a light-house on Lake Ontario.

Anosia plexippus, Vanessa atalanta, V. cardui, V. huntera, Euvanessa antiopa, Cyaniris pseudargiolus and *Euphocades troilus,* recorded by Mr. Henry Edwards.

These seem to be the only records up to the time of Scudder's publication. I hereby append my own notes, in the hope of arousing students to make further observations on this interesting behavior; they all refer to one spot in St. Louis, Missouri, and the time is Central Standard.

Phyciodes tharos Dru. May 17, 1929. Flying around light at 11 p.m.

Pholisora hayhurstii Edw. June 11, 1929. Active at 9:15 p.m.

Epargyreus tityrus Fabr. June 7, 1929. Found on floor, dead, in artificially lighted room.

Papilio troilus L. July, 1929. Male observed flying around indoor 200-watt light after 11 p.m.

The study of periodicity in insects is now coming to the fore, and data of this kind are of value in solving problems, not only on when insects become active, but also why they become active at certain periods in each cycle of twenty-four hours.

HAROLD O'BYRNE, Webster Groves, Missouri.

A Preoccupied Name in the Oxybeline Wasps (Hym.: Sphecidae).

Oxybelus taprobanensis nom. nov.

Oxybelus ceylonicus Cameron, Ann. & Mag. Nat. Hist. 1900, V: 40; nec *Oxybelus ceylonicus* Cameron, Mem. & Proc. Manchester Lit. & Phil. Soc. 1897, XLI:79. V. S. L. PATE.

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*In his *Frail Children of the Air.*

List of the Titles of Periodicals and Serials Referred to by Numbers in Entomological Literature in Entomological News.

1. Transactions of The American Entomological Society. Philadelphia.
2. Entomologische Blätter, red. v. H. Eckstein etc. Berlin.
3. Annals of the Carnegie Museum. Pittsburgh, Pa.
4. Canadian Entomologist. London, Canada.
5. Pysche, A Journal of Entomology. Boston, Mass.
6. Journal of the New York Entomological Society. New York.
7. Annals of the Entomological Society of America. Columbus, Ohio.
8. Entomologists' Monthly Magazine. London.
9. The Entomologist. London.
10. Proceedings of the Ent. Soc. of Washington. Washington, D. C.
11. Deutsche entomologische Zeitschrift. Berlin.
12. Journal of Economic Entomology, Geneva, N. Y.
13. Journal of Entomology and Zoology. Claremont, Cal.
14. Entomologische Zeitschrift. Frankfurt a. M., Germany.
15. Natural History, American Museum of Natural History. New York.
16. American Journal of Science. New Haven, Conn.
17. Entomologische Rundschau. Stuttgart, Germany.
18. Internationale entomologische Zeitschrift. Guben, Germany.
19. Bulletin of the Brooklyn Entomological Society. Brooklyn, N. Y.
20. Societas entomologica. Stuttgart, Germany.
21. The Entomologists' Record and Journal of Variation. London.
22. Bulletin of Entomological Research. London.
23. Bollettino del Laboratorio di Zoologia generale e agraria della R. Scuola superiore d'Agricultura in Portici. Italy.
24. Annales de la société entomologique de France. Paris.
25. Bulletin de la société entomologique de France. Paris.
26. Entomologischer Anzeiger, hersg. Adolf Hoffmann. Wien, Austria.
27. Bolletino della Società Entomologica. Genova, Italy.
28. Ent. Tidskrift utgifen af Ent. Föreningen i Stockholm. Sweden.
29. Annual Report of the Ent. Society of Ontario. Toronto, Canada.
30. The Maine Naturalist. Thornaston, Maine.
31. Nature. London.
32. Boletim do Museu Nacional do Rio de Janiero. Brazil.
33. Bull. et Annales de la Société entomologique de Belgique. Bruxelles.
34. Zoologischer Anzeiger, hrsg. v. E. Korschelt. Leipzig.
35. The Annals of Applied Biology. Cambridge, England.
36. Transactions of the Entomological Society of London. England.
37. Proceedings of the Hawaiian Entomological Society. Honolulu.
38. Bull. of the Southern California Academy of Sciences. Los Angeles.
39. The Florida Entomologist. Gainesville, Fla.
40. American Museum Novitates. New York.
41. Mitteilungen der schweiz. ent. Gesellschaft. Schaffhausen, Switzerland.
42. The Journal of Experimental Zoology. Philadelphia.
43. Ohio Journal of Sciences. Columbus, Ohio.
44. Revista chileña de historia natural. Valparaiso, Chile.
45. Zeitschrift für wissenschaftliche Insektenbiologie. Berlin.
46. Zeitschrift für Morphologie und Ökologie der Tiere. Berlin.
47. Journal of Agricultural Research. Washington, D. C.
48. Wiener entomologische Zeitung. Wien, Austria.
49. Entomologische Mitteilungen. Berlin.
50. Proceedings of the U. S. National Museum. Washington, D. C.
51. Notulae entomologicae, ed. Soc. ent. helsingfors. Helsingfors, Finland.
52. Archiv für Naturgeschichte, hrsg. v. E. Strand. Berlin.

53. Quarterly Journal of Microscopical Science. London.
54. Annales de Parasitologie Humaine et Compareé. Paris.
55. Pan-Pacific Entomologist. San Francisco, Cal.
56. "Konowia". Zeit. für systematische Insektenkunde. Wien, Austria.
57. La Feuille des Naturalistes. Paris.
58. Entomologische Berichten. Nederlandsche ent. Ver. Amsterdam.
59. Encyclopédie entomologique, ed. P. Lechevalier. Paris.
60. Stettiner entomologische Zeitung. Stettin, Germany.
61. Proceedings of the California Academy of Sciences. San Francisco.
62. Bulletin of the American Museum of Natural History. New York.
63. Deutsche entomologische Zeitschrift "Iris". Berlin.
64. Zeitschrift des österr. entomologen-Vereines. Wien.
65. Zeitschrift für angewandte Entomologie, hrsg. K. Escherich. Berlin.
66. Report of the Proceedings of the Entomological Meeting. Pusa, India.
67. University of California Publications, Entomology. Berkeley, Cal.
68. Science. New York.
69. Comptes rendus hebdoma. des séances de l'Académie des sciences. Paris.
70. Entomologica Americana, Brooklyn Entomological Society. Brooklyn.
71. Novitates Zoologicae. Tring, England.
72. Revue russe d'Entomologie, Leningrad, USSR.
73. Quarterly Review of Biology. Baltimore, Maryland.
74. Sbornik entomolog. národniho musea v Praze. Prague, Czechoslavokia.
75. Annals and Magazine of Natural History. London.
76. The Scientific Monthly. New York.
77. Comptes rendus heb. des séances et mémo. de la soc. de biologie. Paris.
78. Bulletin Biologique de la France et de la Belgique. Paris.
79. Koleopterologische Rundschau. Wien.
80. Lepidopterologische Rundschau, hrsg. Adolf Hoffmann. Wien.
81. Folia myrmecol. et termitol. hrsg. Anton Krausse. Bernau bei Berlin.
82. Bulletin, Division of the Natural History Survey. Urbana, Illinois.
83. Arkiv för zoologie, K. Svenska Vetenskapsakademien i. Stockholm.
84. Ecology. Brooklyn.
85. Genetics. Princeton, New Jersey.
86. Zoologica, New York Zoological Society. New York.
87. Archiv für Entwicklungs mechanik der Organ., hrsg. v. Roux. Leipzig.
88. Die Naturwissenschaften, hrsg. A. Berliner. Berlin.
89. Zoologische Jahrbücher, hrsg. v, Spengel. Jena, Germany.
90. The American Naturalist. Garrison-on-Hudson, New York.
91. Journal of the Washington Academy of Sciences. Washington, D. C.
92. Biological Bulletin. Wood's Hole, Massachusetts.
93. Proceedings of the Zoological Society of London. England.
94. Zeitschrift für wissenschaftliche Zoologie. Leipzig.
95. Proceedings of the Biological Soc. of Washington, Washington, D. C.
96. La Cellule. Lierre, Belgium.
97. Biologisches Zentralblatt. Leipzig.
98. Le Naturaliste Canadien. Cap Rouge, Chicoutimi, Quebec.
99. Mélanges exotico-entomologiques, Par Maurice Pic. Moulins, France.
100. Bulletin Intern., Académie Polonaise des Sci. et des Lett. Cracovie, Poland.
101. Tijdschrift voor entomologie, Nederlandsche Entomol. Ver., Amsterdam.
102. Entomologiske Meddelelser, Entomologisk Forening, Copenhagen.
103. Journal of the Kansas Entomological Society, Lawrence, Kansas.

Entomological Literature

COMPILED BY FRANK HAIMBACH AND LAURA S. MACKEY
UNDER THE SUPERVISION OF E. T. CRESSON, JR.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species will be recorded.

The numbers **within brackets** [ ] refer to the journals, as numbered in the list of Periodicals and Serials published in the January and June numbers (or which may be secured from the publisher of Entomological News for 10c), in which the paper appeared. The number of, or annual **volume**, and in some cases the part, heft, &c. the latter **within** ( ) follows; then the pagination follows the **colon** :

All continued papers, with few exceptions, are recorded only at their first installments.

*Papers containing new forms or names have an * preceding the author's name.

(S) Papers pertaining exclusively to neotropical species, and not so indicated in the title, have the symbol (S) at the end of the title of the paper.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

☞ *Note the change in the method of citing the bibliographical references, as explained above.*

Papers published in the Entomological News are not listed.

GENERAL.—Allard, H. A.—Our insect instrumentalists and their musical technique. [An. Rep. Smiths. Inst.] 1928: 563-591, ill. **Burgess, A. F.**—Imported insect enemies of the gipsy moth and the brown-tail moth. (S). [U. S. Dept. Agric.] Tech. Bull. 86: 147 pp., ill. **Cockerell, T. D. A.**—Some results of a journey to Kaieteur Falls, British Guiana. [75] 4: 439-444. **Crowell, M. F.**—A discussion of human and insect societies. [5] 36: 182-189. ***Ewing, H. E.**—A manual of external parasites. 225 pp., ill. Springfield, Illinois, 1929. [New genera in Mallophaga, Anoplura & Siphonaptera]. **Ferris, G. F.**—The principles of systematic entomology. [Stanford Univ. Pub. Biol. Sci.] 5: 3-169, ill. **Horn, W.**—Ueber die resolutionen des IV. Internationalen Entomologen-Kongresses in Ithaca, 12-18 August 1928. [18] 23: 333-335. **Kusnezov-Ugamskij, N. N.**—Das massenauftretten einiger insekten in ihren uberwinterungsorten und biologische bedeutung dieser erscheinung. [Rev. Zool. Russe] 9: 124-125. **Murillo, L. M.**—Clave dicotomica general de los insectos. [Rev. Soc. Colombiana Cien. Nat.] 4: 195-200. **Park, O.**—Ecological observations upon the myrmecocoles of Formica ulkei, especially Leptinus testaceus. [5] 36: 195-215, ill. **Strand, E.**—Down with the typecult. [5] 36: 228-231. **Strickland, E. H.**—Larder beetle infestations arising from tent caterpillars. [4] 61: 238.

ANATOMY, PHYSIOLOGY, ETC.—Becker, E.—Zum bau des kopfes der rhynchoten. I Teil. Bau des kopfes von Naucoris cimicoides. [Rev. Zool. Russe] 9: 54-96. **Crowell, M. F.**—A preliminary study of the tracheal system of the

mature larva of Blepharipa scutellata. [5] 36: 220-227, ill. **Needham, D. M.**—The chemical changes during the metamorphosis of insects. [Biol. Rev. & Biol. Proc. Cambridge Phil. Soc.] 4: 307-326, ill. **Rau & Rau.**—The sex attraction and rhythmic periodicity in giant saturniid moths. [Trans. Acad. Sci., St. Louis] 26: 83-221, ill. **Schrader, F.**—Notes on reproduction in Aspidiotus hederae (Coccidae). [5] 36: 232-236, ill. **Verlaine, L.**—L'instinct et l'intelligence chez les Hyménoptères. X.—La reine des abeilles dispose-t-elle à volonté du sexe de ses oeufs? [33] 69: 224-238. **Wojtusiak, R. J.**—Entwicklungsgeschichtliche und psychographische studien an Mamestra-Raupen. [100] 1929: 1-54, ill. Ueber die raumorientierung bei Pieris-Raupen. [100] 1929: 59-66, ill.

ARACHNIDA AND MYRIOPODA. ***Ewing, H. E.**—(See under General.) **Roewer, C. F.**—Weitere weberknechte III. [Abh. Naturw. Ver. Bremen] 27: 179-284, ill. **Savory, T. H.**—On wolf-spiders' memories. [75] 4: 524-528.

THE SMALLER ORDER OF INSECTS—*Ewing, H. E.—(See under General.) ***Mosley, M. E.**—Oxford University Greenland Expedition, 1928. Trichoptera and Ephemeroptera of Greenland: Additional records made by the Oxford University Expedition to Kugssuk, Godthaab Fjord, W. Greenland, 1928. [75] 4: 501-509, ill.

HEMIPTERA—*Glendenning, R.—A new Callipterine from Victoria, B. C. (Aphididae). [4] 61: 237-238. **Haupt, H.**—Neueinteilung der Homoptera-Cicadina nach phylogenetisch zu wertenden merkmalen. [89] 58: 173-286, ill. **Kusnezov-Ugamskij, N. N.**—Ueber die anolocyclie-erscheinumgen bei pflanzenläusen. [Rev. Zool Russe] 9: 108-110. ***Laing, F.**—Descriptions of new, and some notes on old, species of Coccidae. (S). [75] 4: 465-501, ill. **Severin, H. C.**—A third report upon the Membracidae (Treehoppers) of South Dakota. [Pro. South Dakota Acad. Sci.] 29: 33-49.

LEPIDOPTERA—Bandermann, F.—Erfolgreiche zuchten mit amerikanischen bärenformen aus dem eigelege. [18] 23: 345-347, ill. **Bouvier, M. E. L.**—Sur le classement et la distribution géographique des Saturnioïdes hémileucidiens de la sous-famille des Automérinés. [69] 189: 603-607. ***Brown, F. M.**—A revision of the genus Phoebis. (S). [40] No. 368: 22 pp., ill. ***Comstock, J. A.**—A new species or form of Anthocharis from California. [38] 1929: 32-33, ill. **Comstock, J. A.**—Studies in Pacific coast Lepidoptera. [38] 1929: 22-32, ill., cont. **Fletcher, T. B.**—A list of the generic names used for Microlepidoptera. [Mem. Dept.

Agric. India] 11: 244 pp. **Hayward, K. J.**—Larval descriptions from the Argentine. The larva of Pholus labruscae; a sphingid. [21] 41: 143-144. **McDunnough, J.**—Note on a generic term in the Agrotinae. [4] 61: 241. ***Michael, O.**—Neue oder wenig bekannte Agriasformen vom Amazonasgebiet. [14] 43: 176-177, cont. **Schrader, W.**—Additional experiments with Pyrameis carye. [38] 1929: 20-21, ill. **Vickery, R. A.**—Studies on the fall army worm in the gulf coast district of Texas. [U. S. Dept. Agric.] Tech. Bull. 138: 64 pp., ill.

DIPTERA—*Alexander, C. P.—A list of the crane-flies of Quebec I. [4] 61: 231-236. ***Johannsen, O. A.**—A new species of Sciara from Canada. [4] 61: 223-224. **Johnson, C. W.**—A note on Chilosia hiawatha. [5] 36: 237-238.

COLEOPTERA—*Brown, W. J.—Revision of the species of Aphodius of the subgenus Diapterna. [4] 61: 224-231, ill. **Cros, A.**—Notes sur les larves primaires des Meloidae. [24] 98: 193-222. **Darlington, P. J.**—Notes on the structure and significance of Palaeogyrinus. [5] 36: 216-219. ***Fisher, W. S.**—New species of buprestid beetles from Costa Rica. [50] 76, Art. 6: 20 pp. **Fleutiaux, E.**—Notice sur plusieurs Élatérides malgaches. [24] 98: 223-249. **Friedrich, A.**—Käferklopfen in brasilianischen urwald. [14] 43: 187-190, ill. **Gilbertson, G. I.**—The Cicindelidae (Tiger Beetles) of South Dakota. [Pro. South Dakota Acad. Sci.] 29: 22-26. **Nylen, J. V.**—European Coleoptera at Providence, R. I., in 1928. [5] 36: 219. ***Ochs, G.**—Bestimmungstabelle der gyrinidengattung Gyretes nebst neubeschreibungen und kritischen bemerkungen. (S). [79] 15: 62-69. **Ohaus, F.**—Aus der praxis des käfersammlers. XII. Ueber das sammeln und zuchten von mistkäfern. [79] 15: 141-144. cont. ***Pic, M.**—Neue Phrixothrix-arten. (Malacodermata). (S). [26] 9: 375-376. ***Sicard, A.**—Description d'espèces nouvelles de Coccinellidae. (S). [75] 4: 515-524. ***Spaeth, F.**—Die gattung Hemisphaerota. (S). [79] 15: 111-131. ***Wallis, J. B.**—A new species of Odontaeus. [4] 61: 239-241, ill.

HYMENOPTERA.—Balduf, W. V.—Tetrastichus verrucarii, new species, a chalcid parasite of Neuroterus (Cynipidae) on bur oak. [4] 61: 221-222, ill. **Rau, P.**—The silk spun by the larvae of certain social wasps. [4] 61: 219-221. **Rau, P.**—The biology and behaviour of mining bees, Anthophora abrupta and Entechina taurea. [5] 36: 155-181, ill. **Rau, P.**—The nesting habits of the burrowing bee, Epinomia triangulifera. [5] 36: 243-248, ill. **Salt & Bequaert.**—Stylopized Vespidae. [5] 36: 249-282.

ANTS, BEES and WASPS. A Record of Observations of the Habits of the Social Hymenoptera. By Sir JOHN LUBBOCK (LORD AVEBURY). New ed., based on the 17th, edited and annotated by J. G. MYERS. With four colored plates by A. J. E. Terzi. E. P. Dutton Co., New York. 1929. Pp. xviii, 377, 6 pls., 31 text figs. $3.75.

In this new edition of Lubbock's classical treatise on Ants the original text has been left intact and occupies about two-thirds of the volume. The remaining third, except for a few of Lubbock's own appendices, consists of annotations by the editor. These are exceedingly well done and greatly enhance the value of the book to readers who are not so familiar with the most recent writings upon insect behavior and the ecology of the social insects. Just as Lubbock himself continually inserted among the records of his own work the observations and conclusions of his predecessors and contemporaries including Huber, Forel, Emery, von Hagens, and others, so the present editor, following the spirit of Lubbock, has made available, in the annotations, the most recent observations and theories of Forel, Wheeler, von Frisch, Donisthorpe, Eidmann, Bequaert, Lutz, and others. These notes are largely actual quotations. Among them we find translations of von Frisch's work, being the most extensive account which has yet appeared in English. In the notes and in the text we find recorded both observations and interpretations and in both places it is the observations which excite our interest and the interpretations which merely divert us. We thus come to realize that good observations are ageless and permanent if recorded with sufficient care; and we find, indeed, that Lubbock has survived because he did not fall into the error of giving "general statements rather than . . . accounts of the particular experiments and observations on which these statements rest," for which Lubbock criticizes Huber on one occasion. Altogether the book continues to fulfiill the author's purpose in that it shows "the great interest of the subject and the numerous problems which remain to be solved."—R. G. SCHMIEDER.

INSECTS THEIR STRUCTURE & LIFE. A Primer of Entomology. By GEORGE H. CARPENTER, D.Sc., Keeper of the Manchester Museum, sometime Professor of Zoology in the Royal College of Science for Ireland. Second edition, revised. New York, E. P. Dutton & Co., publishers. 21 x 14 cm., xii +335 pp., 184 text figs., 4 colored plates. $3.75. Received from the publishers Oct., 1928; not dated except after the preface: April, 1924.

Thirty years ago the present reviewer wrote a notice of the

first edition of this book, occupying a page in the NEWS for November, 1899. The preface to the volume now before us makes it evident that a second edition appeared in 1924. A copy of that date is not available and how far this revision differs (if at all) we can not say; no work of any year later than 1924 is cited in the classified "References to Literature", which occupy pp. 310-323. As compared with the first edition, the number of the chapters is the same and so (practically) are their titles and their subheadings, except that sections on wing-growth and metamorphosis have been added to Chap. II (Life History of Insects), on Germ-plasm and Body, Mutations, Alternative Inheritance, Sex-linked Inheritance, Inheritance and Segregation, Germinal Modifications and Darwinism and Mendelism to Chapter III (Classification and Evolution of Insects) and on Protura to Chap. IV (Orders of Insects). Many minor changes have been made in the text throughout the book and the page forms are entirely new. There are 184 text figures, the same number as before, but some of those of the first edition have been combined under one number and six are new to this text (nos. 22, 58, 91, 93, 135, 172). Four colored plates, from Poulton, Bateson and Watson, lacking in the first edition, illustrate protective resemblance in caterpillars, alternative (Mendelian) inheritance in moths, two species of Saturnid silk moths and their cocoons and the mimetic female varieties of *Papilio dardanus*. The literature list at the conclusion of the volume has been largely revised, although the number of titles (237) is only 20 more than that given in 1899.

This work of Carpenter's most resembles Folsom's among our American text books, in its many-sided treatment of the subject, but differs therefrom in giving much more space to taxonomy, describing the principal families under each order; but it is not designed to serve as a means of further identification, nor does it contain keys. It deals but very briefly (pp. 281-283) with the economic aspects of insects in their relations to man. All in all, it is an excellent volume and its illustrations, being taken so largely from American sources, fit it as well for use on this side of the Atlantic as in Great Britain.

P. P. CALVERT.

INSECTS, TICKS, MITES AND VENOMOUS ANIMALS OF MEDICAL AND VETERINARY IMPORTANCE. Part I.—Medical. By WALTER SCOTT PATTON, M.B., Dutton Memorial Professor of Entomology, Liverpool University, and Liverpool School of Tropical Medicine, and ALWEN M. EVANS, D.Sc., Lecturer on

Entomology in the same School. Illustrated by Edith Mary Patton, Alwen M. Evans and A. J. Engel Terzi. Photographs by M. Brown. With a Foreword by Emeritus Professor Robert Newstead. Made in Great Britain by H. R. Grubb, Ltd., Croydon. MCMXXIX. Crown 4to. x+785 pp., 374 text figs., 60 plates, 3 maps, large illustrated revision sheet. Obtainable only from the Entomological Dep't., Liverpool School of Tropical Medicine, at 20 shillings, including packing and postage, to any part of the world. The U. S. duty will bring the price to about $5.68.

This portly volume replaces Patton and Cragg's *Textbook of Medical Entomology* (1913), stated to be now out of date and out of print. It has been published privately in order that it may be sold at the very reasonable price above stated. Had it been published in the usual way its price would have been prohibitive to most medical officers and nearly all students of entomology.

The authors state in the preface: "In writing this book we have had two objects in view. It has been primarily written for the medical officer approaching the subject for the first time . . . The second, and perhaps the most weighty reason . . . . , is to make available in handy form not only the essentials of the subject, but a great deal of more detailed information which is at present neither available in books on entomology, nor even in papers on the subject . . . we have . . . devoted a large part of this book to the subject of morphology and phylogeny, believing that the former is of fundamental importance, not only as a guide to the systematic part of the subject, but also as a help to the investigator, in understanding the anatomy and homologies of the structures in which he may find pathogenic parasites."

Following the preface is a page of dedication of this book "to the memory of the following twelve well-known Medical Men and Scientists, and to other Workers of all Nationalities who have died while investigating the Etiology of those Diseases the causal Organisms of which are transmitted by Insects and Acari; J. M. Lazear, W. Myers, J. E. Dutton, F. M. G. Tulloch, F. Schaudinn, J. Carroll, S. von Prowazek, A. W. Bacot, F. W. Cragg, A. Stokes, H. Noguchi and W. A. Young."

Primarily this book is intended for those following the "course for the diploma in Tropical Medicine, University of Liverpool, and for the diplomas in Tropical Medicine and Hygiene in other tropical schools and universities." The Introduction, pp. 3-9, gives an outline of the way in which the course is given at Liverpool and the text is correspondingly arranged

under twenty-eight meetings of the class. Curiously enough, there is no table of contents of the book, although an alphabetical index occupies pp. 771-785. The following summary will indicate the sequence of subjects discussed, irrespective of their grouping under class "meetings".

Classification of the Animal Kingdom, of the Arthropoda and of the Hexapoda to Orders (pp. 10-36). External Anatomy (pp. 37-103) and Internal Anatomy (pp. 104-171) of Insects with especial reference to the Diptera. Wing Venation of the Diptera (pp. 171-189). Systematic Study of the Diptera of Medical Importance, beginning with the Nematocera and ending with the myiasis-producers (pp. 189-494). Siphonaptera (pp. 494-541). Anopleura, including Mallophaga, and Hemiptera (pp. 541-601). Arachnida, Acarina (pp. 601-664, 676-690). Linguatulida, Copepoda, Insects of Orders other than those above mentioned (pp. 664-675), Leeches (p. 675). Stinging, Vesicating and Venomous Animals (pp. 690-706). Dissecting, Collecting, Preserving, Mounting and Breeding Methods (pp. 706-735). Principles underlying control of injurious arthropods, control of mosquitoes and of *Glossina* (pp. 735-770).

Under each "meeting" the text is arranged in two parts, the first being the synopsis of a lecture, the second being illustrative laboratory work, comprising descriptions of mounted slides, or of specimens preserved in other ways, 558 in all, with notes on the habits, stations and other peculiarities of the species concerned. On page 8, the authors rightly say: "By cutting down the time spent on lecturing on this subject to the absolute minimum, more time is available for the study of the practical material in the laboratory where alone the student will learn the essentials of the subject." Some teachers will, perhaps, consider that even more of the lecture material may be transferred to the laboratory. Here and there are to be found summaries of certain lectures and laboratory work in order to emphasize the most important facts for the student. There is, in consequence, much repetition throughout the book.

With respect to taxonomy, it may be noted that only two suborders of Diptera are recognized, Orthorrhapha and Cyclorrhapha, the Pupipara being classified as subfamilies of the Muscidae Calypteratae; the Cyclorrhapha "are classified in two families, the Muscidae Acalypteratae and the Muscidae Calypteratae"; the species formerly included in the Oestridae "are classified in subfamilies of the Muscidae Calypteratae and are placed in what is believed to be their natural positions."

"It will be noted that we have retained the familiar and well

established names of medical importance. We see no satisfactory reason for increasing the difficulties of the medical officer by asking him to learn new and unfamiliar names of doubtful validity. To correct the name of an insect of old standing, in supposed obedience to the letter of the Law of Priority, is often to act contrary to the spirit of that Law. The plea for the retention of an old and familiar name, notwithstanding its questionable validity, is to be urged with particular force, especially when the insect named is either of medical or veterinary importance" (p. vii). "In this book the old and familiar names are strictly adhered to, for instance the yellow fever mosquito, the important carrier of the unknown parasite of the disease, is *Stegomyia fasciata;* the important carrier of the parasites of malaria in Tropical Africa is *Anopheles costalis.* Although the alternative names are given, we recommend our students to use these familiar names and no others" (p. 36). ["So this is progress!"]

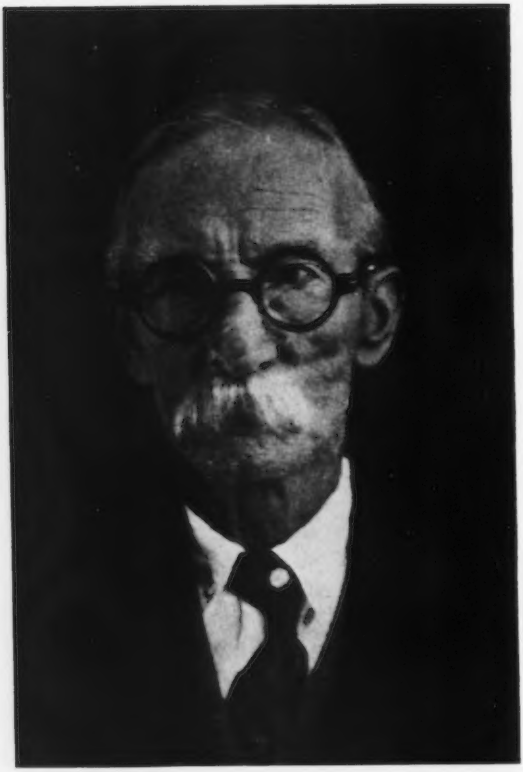
References to literature have been entirely omitted from this volume on the ground that "the medical officer stationed in the tropics is an isolated worker, has no library and certainly cannot afford to carry about with him a large number of journals and papers in which the information he wants may be found." We suspect that many others, not peripatetic medical officers, who will be glad to use this book for various purposes, will find it necessary to supply this lack.

The authors rightly claim that "the illustrations of the book are its special feature, for a large proportion are original and are drawings of the specimens exhibited" in the courses at Liverpool. Others are from the old *Patton and Cragg* and from a variety of sources. The fullness of their lettering and explanation will be of the greatest service to the many users which the book will find. Especially noteworthy are the numerous figures of internal organs and of sections, which will interest all students of morphology. The large "revision sheet" (26¾ x 17 inches), consisting of figures of the principal arthropods discussed and attached to the back cover of the book, must not be forgotten.

We confidently predict that the authors' hopes as to the great usefulness of their work to both parasitologists and to those engaged in other fields of entomology will be fully realized.

Three other parts or volumes uniform with this are planned as follows: Part 2, Public Health by Patton, ready in 1930; Part 3, Tropical Hygiene by Patton and Evans, ready in 1930; Part 4, Veterinary by Patton and Pillers, ready in 1931.

P. P. CALVERT.



THOMAS NESMITH BROWN.

OBITUARY.

THOMAS NESMITH BROWN.

(Portrait, Plate III).

Thomas Nesmith Brown was born in Uniontown, Pennsylvania, on December 24, 1851, and died in the city of his birth on January 19, 1929. Thus briefly are recorded the beginning and the end of a life outwardly uneventful but in reality of singular interest and achievement.

While he was still a young man, Mr. Brown's attention became attracted to entomology through reading a book on butterflies, which he purchased at second hand. The interest thus aroused led him to further study, and to the collection of this and other groups; and for more than forty years he continued to build up a large and valuable private collection, especially of Lepidoptera and Coleoptera. He spent a year in California (1903) and a year in Oklahoma (1913); but for the most part his work was confined to western Pennsylvania and West Virginia, and especially the immediate vicinity of Uniontown.

He was particularly successful in collecting Cychrini, which he exchanged in large numbers for specimens from all over the world. There are at least two collections in Pacific Coast universities containing series of this group bearing Mr. Brown's name as collector, which is partially representative of the extent of his exchanges.

His method of collecting was interesting. He would visit some of the deep, secluded valleys among the mountains near Uniontown, and pile flat stones one on top of another, wherever he could find them. The following year he would go back and collect the beetles that had taken up residence in the convenient crevices thus provided. I am not sure that this procedure was original with Mr. Brown, but it certainly was effective as he used it, especially for such forms as *Scaphinotus* (*Irichroa*) *germari* Chaud. and *ridingsi* var. *monongahelae* Leng.

Mrs. Brown wrote me shortly after his death, "He had about fifteen thousand specimens in his collection, and he still was collecting till we would not let him go to the mountains, for it was not safe for him in the condition he was in." My own

memory is that his collection of all groups was even larger than this.

This indefatigable collector found time also to assemble an interesting group of geological specimens, and of Indian relics. He was further a skillful artist, executing a number of paintings of butterflies and moths, accurate and beautiful in detail. Most of his collections were given, shortly before his death, to the Benjamin Franklin High School, of Uniontown.

Mr. Brown's achievements were the more remarkable in view of the limitations under which he labored. Without even the advantage of attending high school, he educated himself, reading widely and understandingly in many scientific fields. Hampered by limited means, and forced even in the feebleness of age to earn his living day by day (he was a horticulturist and landscape gardener), he allowed nothing to discourage him from scientific and intellectual pursuits. I visited him last on his seventy-seventh birthday. In broken health, and mourning the recent death of his daughter, he was self-contained, uncomplaining, glad to converse on scientific subjects, eager for intellectual adventure, and undismayed by the spiritual adventure on which he knew he was soon to embark.

He is survived by his widow, Mrs. Louise Malone Brown, to whom he was married on September 13, 1877, and by one daughter, Mrs. Phoebe Glick, of Uniontown.

While Mr. Brown was known through correspondence and exchange to a wide circle of entomologists at home and abroad, his principal service was to his own community, where all his life he labored to stimulate interest in natural history, and in the study of the local fauna, flora, and physiography. He represented a fine type of amateur naturalist all too rare in America today. Particularly interested in young people, he always warmly welcomed the boys who came to him with their questions about the out-of-doors, encouraging and instructing them, lending his books and giving freely of his time. Those boys, one of whom was the present writer, will always hold him in grateful memory.

ROBERT C. MILLER.
University of Washington.

ENTOMOLOGICAL NEWS for December, 1929, was mailed at the Philadelphia Post Office on December 19, 1929.

EXCHANGES

This column is intended only for wants and exchanges, not for advertisements of goods for sale. Notices not exceeding three lines free to subscribers.

These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and only when necessary those at the top (being longest in) are discontinued.

Wanted—Lepidoptera, especially Lycaenidae and Hesperiidae, from all localities, in exchange for local Lepidoptera. Harold I. O'Byrne, 501 Pacific Ave., Webster Groves, Missouri.

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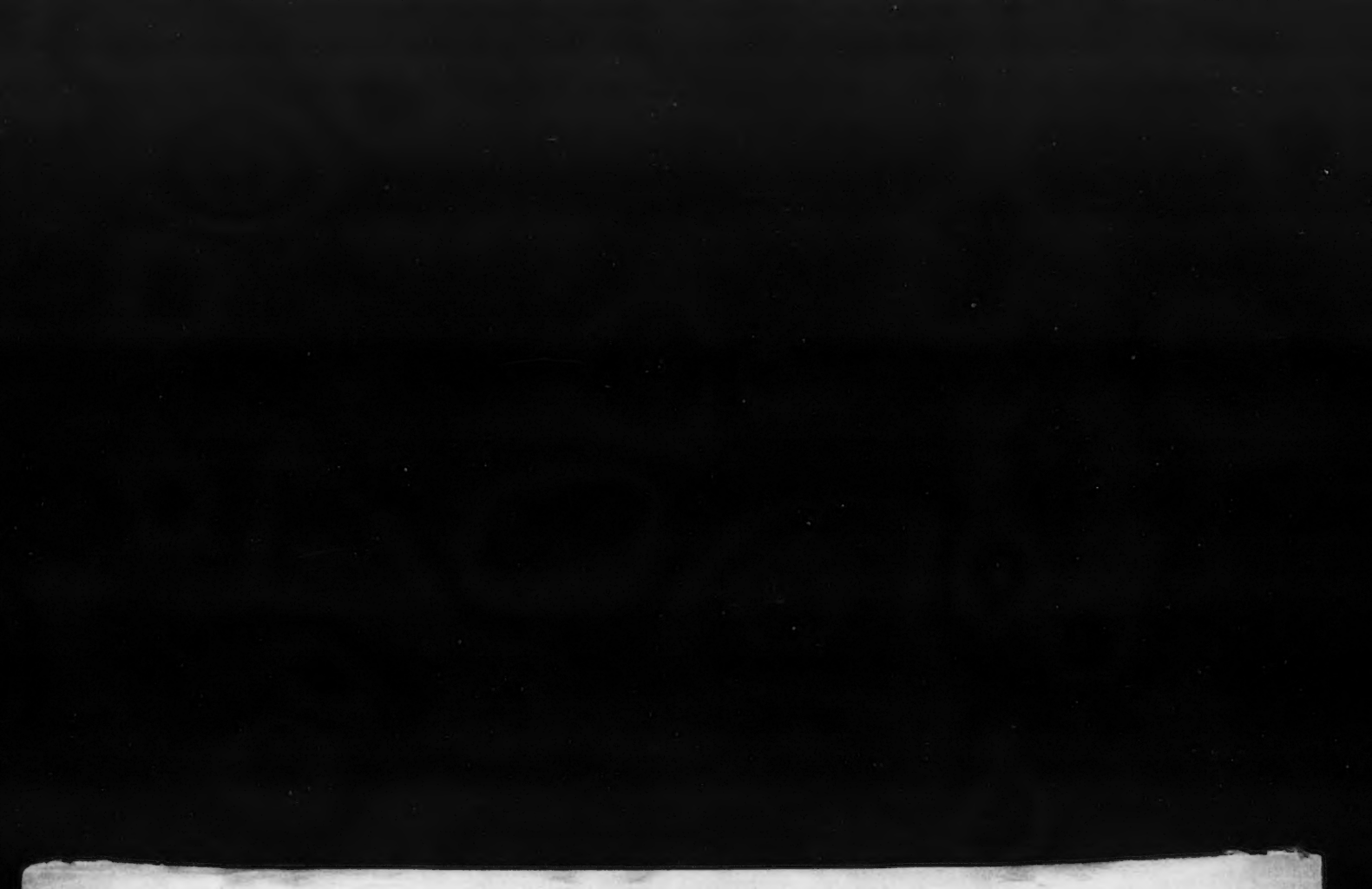
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